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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WERNER, BRIAN P

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/516,581

Applicant(s)

DELAROSA ET AL.

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 29, 2004 (i.e., Amendment B, Paper No. 9) has been entered. Claims 1-39 remain pending.

Information Disclosure Statement

2. Applicant is reminded of his duty to disclose material information known to the applicant that is "material to patentability" (Rule 56). For example, figures 1 and 2 of the Into (US 4,938,600 A) reference cited and applied below are almost identical to the applicant's figures 1 and 2; and the disclosures are almost the same. It is clear from the rejection below that the Into reference is extremely relevant to the prosecution. Into is a good example of a "material" reference. Thus, disclosure of any and all such material known to the applicant is requested.

Response to Arguments

3. Applicant's arguments with respect to claims 1-39 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-9, 11-22, 24-35 and 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Into (US 4,938,600 A).

Regarding claim 1, which is representative of claim 27, Into discloses a method for measuring the registration between two integrated circuit layers, one residing over the other ("methods and apparatus for measuring the registration between overlying layers of a semiconductor wafer" at column 1, line 10), comprising:

generating a top-down image of a field of view of the two integrated circuit layers (figures 1 and 2, numeral 22; "camera 22 have a vertical optical axis" at column 4, line 7), each of the layers having a respective visible feature in the image (figures 3A-4B;

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e.g., figure 4A, numeral 70 is a visible feature on a first layer, and numeral 72 is a visible feature on a second layer; refer to column 6, lines 20-23);

digitizing the image and processing the digitized image ("electrical signals representative of the image are supplied to an image processor 28 and a computer 30" at column 4, line 15; "computer 30 processes the signals from the camera 22" at column 4, line 24; The computer is performing the measurement, and thus the signals must be digitized) to determine a relative location of the visible feature of one layer relative to the feature of the other layer (e.g., figure 4A, numerals 70a and 72a each correspond to the center points of the squares 70 and 72; refer to column 6, line 24; see also "to measure displacement between layers of the semiconductor wafer 16" at column 4, line 26; "by measuring the displacement of patterns 50 and 54, the registration between layers 52 and 56 can be quantified" at column 4, line 44); and

determining if the relative location is within acceptable design limits for the integrated circuit layers ("acceptable tolerances on displacement between layers" at column 1, line 28; "outside tolerable limits" at column 1, line 47).

Regarding claim 14, Into discloses an apparatus corresponding to the apparatus disclosed by the applicant. For example, the only two figures depicting the applicant's apparatus appear as figures 1 and 2, which are almost IDENTICAL to Into's figures 1 and 2. The only difference appears at applicant's figure 2, numeral 146. However, according to the specification, the structure of numeral 146 could comprise "a microscope and a video camera" at applicant's specification page 7, line 19. Thus, the

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disclosed structures being equivalent, Into meets the apparatus and means-plus-function language of claim 14.

Regarding claims 2-5, 15-18 and 28-31, x and y locations of first and second feature reference points are found (e.g., figure 4A, numerals 70a and 72a), from which delta-x and delta-y displacement is measured (figure 4A, "X1" and "Y1"; "x-axis displacement" and "y-axis displacement" at column 6, lines 26-27; a "displacement" as defined by Into is, for example, a "displacement of the squares [or other features] relative to each other" at column 1, line 40; given the situation of figure 4A, where the location of square centers 70a and 72a are determined, from which a displacement is calculated, it necessarily follows that the displacement is a subtraction of x and y values of the coordinates of the square centers).

Regarding claims 6-8, 19-21, and 32-34, Into discloses comparing the relative location with stored tolerance limits (as described in the claim 1 rejection), including calculating an offset value (figure 4A, "X1" and "Y1"; "x-axis displacement" and "y-axis displacement" at column 6, lines 26-27; a "displacement" as defined by Into is, for example, a "displacement of the squares [or other features] relative to each other" at column 1, line 40; given the situation of figure 4A, where the location of square centers 70a and 72a are determined, from which a displacement is calculated, it necessarily follows that the displacement is an offset of one square from the other) and comparing the offset to a predetermined tolerance ("verify registration" and "if the displacement is outside tolerable limits" at column 1, lines 45-48).

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Regarding claims 9, 11, 12, 22, 24, 25, 35, 37 and 38, an imaging system is disclosed comprising a video camera and a microscope (figure 2, numerals 20 and 22).

Regarding claims 13, 26 and 39, semiconductor layers are disclosed (layers of a semiconductor wafer" at column 1, line 10).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 10, 23 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Into (US 4,938,600 A) and Seiler et al. (US 4,766,311 A).

Into does not teach a scanning electronic microscope.

Seiler discloses a system that captures images of wafers, where the image scanner is a scanning electron microscope ("scanning electron microscopes" at column 2, line 60).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the electron microscope of Seiler as the image pickup device required by Into to capture images that are "highly precise" (Seiler, column 1, line 10).

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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner
Primary Examiner
Art Unit 2621
July 1, 2004


BRIAN WERNER
PRIMARY EXAMINER